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ABSTRACT

Some researchers estimate that 99 percent of occupations require some ability to read. Yet, illiteracy is a present and growing problem for many businesses. Some researchers contend that the basic educational system does not prepare workers to read on the job. Many teachers consider reading an elementary skill and do not focus on it in higher grades. Vocational education presupposes a knowledge of reading before occupationally related work is attempted in a supposition not always grounded in fact. In an attempt to find ways to prepare potential workers for job-related reading, researchers are examining the differences between the literacy demands while on the job and while training for the job. However, some researchers find on-the-job reading much more demanding than job-training reading, whereas others have found the opposite to be likely. Another direction of current research is toward the way information gained through reading is processed to enhance occupational effectiveness. More research is needed in order to prepare students for work-related reading. However, it is imperative that the situation that has led to the crisis in occupational literacy not be duplicated in adult literacy programs. Curriculum developers can use the research on adult literacy and adult learning in order to create programs that will effectively prepare adults for the workplace. A six-page reference list is included. (KC)

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Occupational Literacy

and/or

Literacy in the Workplace

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- An insurance company employee pays a policyholder $2,200.00 on a $100.00 claim instead of the $22.00 authorized because she doesn't understand decimals.
- A train motorman, on trial for negligence in a fatal accident, admits that he has trouble reading his service manual, as do many of his co-workers.
- A feed-lot laborer accidentally kills a herd of cattle when he misreads a package label and feeds them poison instead of food.
- A computer company executive who makes $75,000.00 a year reads at a fourth grade level and has his wife help him write sales reports. He once ran up a $200.00 phone bill when he called her from Brussels to help him prepare a speech.

These are brief examples of problems with literacy in the workplace, taken from the newsletter of the Business Council for Effective Literacy. They illustrate the role of basic reading and writing in an employment environment, ie. whether or not a person needs to be able to read and write, and what happens if s/he can't. This is the simplest view of literacy in the workplace, a multi-facetted field of study. At its most complex, it involves all levels and types of literacy skills demanded by the job. The term "occupational literacy" encompasses this complex description; occupational literacy involves all levels of communication, computation and logic skill from the basics to such specialized areas as graphical literacy, technical literacy and computer literacy. An examination of each separately, and of the interrelationships, reveals important implications for adult education programming.

Literacy in the Workplace

There are various perspectives on the role of literacy in the workplace. One is that illiteracy in the workplace is a problem, and this is closely

related to the relationship between illiteracy and unemployment. A second perspective involves the relationship between education and employment, which includes the preparation that is, or is not, provided for literacy in the workplace and for occupational literacy. A third perspective is the necessity for incorporation of occupational literacy skills instruction in Adult Basic Education and adult vocational education curricula. Each perspective merits examination, as they are inter-related.

Although literacy in the workplace may be examined from different positions, one thing remains constant. Research demonstrates that the ability to read job-related materials is a major occupational/functional skill. The Adult Functional Reading study (Murphy, 1975), sponsored by the Educational Testing Service, determined that "reading materials at work is a critical part of the domain (of functional reading activities). A relatively large number of people perform such tasks for a relatively long time and consider them highly important." Sharon (1973), in a major study for the Educational Testing Service involving 5,067 adults, reported that 33% of the sample read at work (out of 38% of adults working on a typical day), that job-related reading was viewed as highly important, and that the people who read at work tended to be from a higher socio-economic level. Diehl (1980) noted that reading at work appears to be an ubiquitous activity: close to 99% of the subjects interviewed for one hundred different occupations representative of the total American employment scene reported doing some reading at work each day. Adams (1979) related reading ability to occupational health and safety. The negative implications of illiteracy for health and safety in the workplace are outlined extensively in a report prepared by the Task Force on Literacy and Occupation Health and Safety (1985), an advisory council to the Ontario

Minister of Labor. Reading, in most cases, is essential to job entry, survival and upward mobility (Rush, 1985; Institute of Medicine, 1984; Mark, 1984). Just as the ability to read promotes independent learning, so it promotes independent working; the ratio of supervisor to worker is generally insufficient to allow for constant interpretation of reading materials for the worker (Thornton, 1977). Bricknell (1975) summarized by stating that reading is the fundamental vocational skill in our society because a person has to be able to read to find out about available jobs, to get a job, to keep a job, to get ahead in a job and to change to another job.

Illiteracy in the Workplace

Literacy in the workplace is linked integrally to the enormous problem of adult functional illiteracy. It is estimated that as many as 20% of the adult population cannot read and write well enough to function in contemporary society (Thomas, 1976), and this spills over to become illiteracy in the workplace. The cost of illiteracy is measured both in human terms and in financial terms. In brief, illiteracy in the workplace costs millions of dollars in low productivity, workplace accidents, absenteeism, poor product quality, and lost management and supervisory time (NCEL, 1986).

Closely related to this is the connection between functional illiteracy and unemployment which also results in expense for individuals and for society. The Business Council for Effective Literacy has determined that up to 75% of the currently unemployed are functionally illiterate. The Chicago-based Coalition for Literacy has calculated the annual costs in America to be $237 billion in lost earnings, $6 billion in social assistance payments, and $8 billion in diminished tax revenues. For society and for

individuals, unemployment has far-reaching negative consequences, psychologically, financially and politically. The inability to read and write at a functional level, therefore, can prevent individuals from working safely and efficiently, and from getting and keeping jobs.

Preparation for Literacy in the Workplace

It would seem logical that if there were adequate preparation for the literacy demands of the workplace, the aforementioned problems would be reduced. In reality, there is very little, if any, such preparation; and an examination of the current situation points to weaknesses that must be corrected over time.

The skills and knowledge needed by individuals to live and work in our society are supposed to be imparted through the educational system. However, many informed and influential people question the adequacy of current educational endeavors to provide training for functional literacy in general (Kozol, 1980; Niebuhr, 1983; Hunter & Harman, 1979), and, specifically, for occupational literacy (Mikulecky, 1982, 1984; Baar-Kessler, 1984). The relationship between education and employment has become tenuous; there are increasing complaints from business, industry, the military and the general public that growing numbers of workers are inadequately prepared for work (Copperman, 1978; Diehl & Mikulecky, 1980; Horne, 1979; Hymowitz, 1981; Jacob and Crandall, 1979; Ross, 1980). There are further complaints that significant numbers of adults do not have sufficient reading skills to function in occupational settings (Gadway & Wilson, 1975; Louis et al., 1970; Murphy, 1975; Northcutt, 1975). Two educational systems are involved in this failure to provide preparation for literacy in the workplace. The first is

the institutions and programs for general education, ie. the K-12 system. The second is the employment-related vocational and/or post-secondary educational institutions, for example, trades training or medical school. The following examination of problems related to literacy instruction that exist in both systems reveals their contribution to the current problems of functional illiteracy in the workplace and occupational illiteracy.

General Education and Literacy

Most adults have had the opportunity to go through the general education system, and many are still functionally illiterate. In designing and implementing ABE and workplace literacy programs, it is essential to examine how the need for both has arisen, and to avoid re-creating the same problems. Literacy-related problems within the general education system may be posed by the teachers, the students, the reading and writing materials, and/or combinations thereof.

Too many teachers know very little about the reading and writing processes (Lee, 1981; Thornton, 1979). They ignore the vital relationship between reading and learning; as a tool to facilitate learning, reading is a unique and predominant mode of preserving and conveying information (Goodman, 1970). Most teachers simply assume that students can read (Herber, 1978), an assumption with no basis in fact (Duke & Powers, 1973). Some commonly held misconceptions are that:

- reading is learned at the primary level and attention to reading beyond that level is unnecessary;
- reading is not a responsibility of the content area teachers;
- teaching reading is a specialized area, beyond the capability of the subject area teacher;
- classroom reading can be circumvented by the use of descriptive handouts and oral presentations (Thornton, 1979).

Lack of knowledge and a negative attitude towards reading cause many teachers to contribute unknowingly to the adult illiteracy problem.

Literacy-related problems may also result from the lack of skills and knowledge on the part of the students. Some problems, such as inadequate concept development, insufficient language proficiency, and deficient textbook and study skills, can prevent individuals from functioning in phases of the educational system (Hawkins, 1977; Vacca, 1981; Pearson & Johnson, 1978; Stansell & DeFord, 1981). In addition, a student may experience deficiencies in subject-specific reading skills; each subject area inherently contains a predominance of certain skill requirements (Cheek & Cheek, 1981), and a student may be weak in only one. Finally, students may simply not be reading at the prerequisite level for the course or grade in question.

Just as literacy-related problems can centre with the teacher and/or the students, so they can with the reading and writing materials. Reading materials such as blackboard notes, exam questions, teacher-made hand-outs, and textbooks may either be too difficult or too easy to read. According to Abram (1981), the readability of materials should be less than or equal to the reading skills of the reader. However, assuming that the students have the prerequisite reading skill levels, research indicates that textbooks used are often too difficult for the intended users (Schulteis & Napoli, 1975; Thornton, 1977; Gibson 1971). It should be noted that readability includes more than what formulae can measure: legibility of print, illustration and color, vocabulary, charts and graphs, conceptual difficulty, syntax, organization, structural and stylistic elements (Harrison, 1980), use of redundancy, types of inferences, abstract terminology (Dawkins, 1975), and concept development and reading ability of the users (Diehl, 1980; Vacca,

1981). Readability may be best used synonymously with suitability, understandability and learnability (Irwin & Davis, 1980). Curran (1976) hypothesized that readability is a necessary but not sufficient condition for comprehensibility, and that both are necessary but not sufficient for useability. All to often the "readability" of the materials used for courses causes problems that negatively affect learning in all areas of general education, as do reading-related difficulties presented by teachers and by students.

Occupational Education and Literacy

The literacy-related problems that exist in general education exist, and are even magnified, in the systems providing education for employment. In addition to problems caused by instructors, students and reading materials, there are further difficulties.

To begin with, reading is treated as a prerequisite to entry to occupational programs; students are supposed to function at a specified grade level as a minimum entrance requirement. It is assumed that trainees are able to read the texts, notes, exams and other curricular materials. Perhaps for this reasons, the majority of American technical and vocational institutions make no provision for either general reading and study skills or occupation-specific reading skills (Thornton, 1980). In a thorough examination of the literature in the Dialog Data Bases concerning reading in post-secondary occupational education, Thornton (1980) found that there was practically no reference to occupation-specific reading skill development, and that, if reading was treated at all, it was a curricular issue.

Occupational education programs are rife with potential literacy-related

problem areas. To begin with, the technical language peculiar to a trade or profession may be complex and difficult to learn (Lee, 1981). For example, trade-related literature may be of a wide range of difficulty according to the task; the amount of technical language, trades language, and lay description; the use of diagram and illustration; and the attendant language-to-diagram ratio (Thornton, 1979). Textbooks and technical manuals often have a very high reading level due to the technical language and the necessity for accuracy before readability (Thornton, 1979).

Then there are the problems that examinations can present. Hunt and Lindley (1977) made the claim that pre-employment tests are often too hard to read; applicants must contend with unnecessary and irrelevant reading demands before they can meet and solve the problems on the job (Mikulecky & Diehl, 1979). As well, tests are usually given in settings which deprive the student of access to other cues or sources of information that s/he might consult on the job in accomplishing job tasks (Jacob & Crandall, 1979). Too, job-training achievement is measured by different tasks and strategies than is actual job performance (Sticht, 1978).

Further complications arise from the fact that most occupation educators lack the background to deal with reading either as a curricular issue or as an occupational skill (Lee, 1981). Many occupational educators emerge from their specialty area, often have less academic and teacher education background, and are hired because of the ability to translate a specialty into job skills (Thornton, 1979).

The most significant problem seems to be that not enough is known about the specific reading demands of most occupations to prepare individuals while in the training process (Auten, 1980; Horne, 1979; Jacob & Crandall, 1979;

Sticht, 1978; Thornton, 1979).

Many of these problems can be solved, thereby obviating the need for ABE and workplace literacy programs over time. Until then, the responsibility falls on literacy and basic education administrators. It is they who must ensure that the ABE instructors possess the following:

1. a thorough knowledge of the reading and writing processes, regardless of their subject area;
2. the ability to assess student's ability and interest, and to individualize instruction;
3. an awareness of the complexity of the "readability" of materials, commercially prepared and their own;
4. knowledge of the differences between reading at school and reading on the job.

Those educators responsible for curriculum development may find direction in the research and practice pertaining to occupational literacy.

Occupational Literacy

The study of occupational literacy has its origins in the concern for adult functional literacy. The term "functional literacy" was first used in World War II by the American Army to categorize individuals who could not use written instructions to adequately perform basic military tasks (Cook, 1977). Since then, many attempts have been made to determine the extent of functional illiteracy in the U.S. and Canada, studies which used different definitions of the concept, which employed different measures, which arrived in estimates ranging from 1 to 20% (Hunter & Harman, 1979), and which have been termed inadequate (Kirsch & Guthrie, 1980). Sticht et al. (1972), Olson (1975), Fisher (1978) and Kirsch and Guthrie (1980) emphasized the need for research to determine how literate a person must be to function in some defined adult

situation by picking out reading tasks encountered in a specific situation, analyzing them and ascertaining the competencies of people who actually complete these tasks. The specific area of job-related reading was pointed to by Bricknell (1975), Levin (1975), Miller (1973) and others. Diehl (1980) noted that occupational literacy is one particular domain of life activities in which to examine the interplay of literacy demands and competencies; that occupational literacy skills have been found to be a highly important functional skill; and that the study of occupational literacy has implications for schools, Adult Basic Education programs, business and industry, and the setting of literacy requirements for jobs. Hence, the study of functional literacy has been narrowed, by some, to the study of functional job literacy or occupational literacy.

Research to Date

Most research in the field of occupational literacy is based on the monumental work of Sticht and his various colleagues at the Human Resources Research Organization. Within the military environment, the research of Sticht et al. (1971-1978) focused on determining the literacy demands of jobs, determining the relationship between literacy-ability and job-ability, developing reliable and valid testing procedures for matching individuals with jobs, and developing ways of restructuring materials to reduce the literacy demands. Among the numerous contributions to current research were the FORCAST readability formula (Caylor et al., 1973) designed to be used with job-related reading materials, and the categories for literacy strategies (reading-to-do and reading-to-learn) which Diehl (1980) expanded upon. Three

important conclusions drawn by Sticht (1975) were:

1. a substantial portion of job trainees are deficient in job reading skills;
2. six weeks of focused job reading training improved job reading skills at least two reading grade level years specific to job reading skills; and
3. programs of intergrated job reading and job skills training are feasible.

Much occupational-literacy research has been conducted by the military; however, it is difficult to obtain, and may not be generalizable to the civilian environment (Mikulecky & Diehl, 1979).

Most research into occupational literacy has been directed at identifying literacy demands for specific jobs. Research in the civilian sector has tended to be minimal; it appears that most research being conducted on testing and establishing literacy requirements is done within companies and is not published. General job analyses are found in such occupational handbooks as the Occupational Outlook Handbook (U.S. Department of Labor, 1978-1979), the Analysis of Occupations Series (Ohio State University, 1973), and Careers Today (Hawes et al., 1977). Smith (1976) researched generic skills for occupational training. Heinemann (1979) analyzed the performance of secretaries in job-related reading tasks. Ross (1980) conducted an analysis of the nature and difficulty of reading tasks associated with beginning office workers' jobs. Spicer (1975) attempted to identify the communication competencies required by future businesspersons. Moe, Rush and Storlie (1979) described the literacy requirements necessary to hold a job in ten occupations and the corresponding requirements necessary to succeed in vocational training programs which prepare individuals for each of those occupations. Chang (1983) researched the curricular and occupational reading demands of the plumbing trade. Diehl and Mikulecky (1980) interviewed workers in one hundred

occupations and examined the general nature of on-the-job literacy tasks, the difficulty of job materials, the relationship between that difficulty and an individual's reading ability, the relationship between literacy and job success, and the characteristics of competent and non-competent readers. This means that ABE curriculum developers can find some specific information about the literacy demands of a limited number of occupations in research reports.

The generalizability and usability of much of the above effort is affected by natural limitations and by questionable methodologies. It has been pointed out that research done in the military environment may not be generalizable to civilian situations, because the military may differ markedly from civilian workplaces in speed of training, in hiring and promotion policies and criteria, in the number of years experience workers have at a given job, and in the relative age and background of workers (Diehl, 1980). Also, the numerous projects which relied on readability formulae to determine the difficulty of reading materials (Diehl, 1980; Mockovac, 1974; Moe et al., 1979) are subject to question (Curran, 1976; Horne, 1979; Jacob & Crandall, 1979). The weakness of other studies has been the sole use of mailed questionaires (Farning & Boyce, 1976; Howell, 1976), the reliance on self-report data (Diehl & Mikulecky, 1980), and/or data gained from supervisors/employers (Smith, 1976). General job analyses done by task analysts in business, industry and the military are considered too general because they are based on representative tasks rather than actual specific tasks (Diehl, 1979; Horne, 1979). Therefore, before adopting research findings into curriculum and instruction, educators must be wary of how the information has been gathered and how generalizable it is.

As a result of criticisms, current research has taken two different

tacts. In an attempt to narrow and clarify the field, researchers are examining the differences between the literacy demands while on the job and while training for the job. There are major differences between curricular reading demands in the school/training setting and occupational reading demands in terms of cognitive demands, the availability of extra-linguistic cues, the uses of information gained, and the nature and frequency of tasks encountered (Diehl & Mikulecky, 1980; Mikulecky, 1981; Moe, 1979; Ross, 1980; Sticht, 1978; Chang, 1983; Moe, 1983). Data gathered by Mikulecky (1981) suggests that workers face far more stringent literacy demands on the job than students currently face in school; on the average, students from both technical and high schools read less in school than they will be expected to on the job. Sticht (1978) found that reading for job preparation was more demanding than reading for job performance; curricular reading demands involve reading to form and retain new concepts, ie. reading-to-learn, as opposed to occupational reading to look up specific information for relatively immediate use, ie. reading-to-do.

This is closely related to the second direction of current research, ie. the way information gained through reading is processed to enhance occupational effectiveness. According to Mikulecky (1985), evidence suggests that job performance may be more closely related to metacognitive aspects of literacy than to the basic literacy abilities of achieving literal comprehension or communicating simple messages. Guthrie, et al. (1984) conducted a study, based on the psychological point of view of the participants, to construct measures of reading competencies that are frequently needed in an occupational setting and to describe the influence of the components of reading practice on these competencies. It has been

demonstrated that people can and do acquire competencies to meet their occupational reading needs, emphasizing the importance of studying reading and literacy as a system of culturally organized skills and values that are acquired in particular contexts to satisfy particular needs (Kirsch & Guthrie, 1982). This current research will help give direction to adult literacy and occupational literacy programs.

Other studies in occupational literacy have had different focuses. Projects have been directed at occupational/vocational curriculum development. Farning and Boyce (1976) attempted to develop and verify a list of competencies for the communication skills area in vocational/technical post-secondary education; Howell (1976) identified the competencies in English needed by vocational students preparing for trade and industrial occupations in community colleges and technical institutes in North Carolina; Horne (1979) investigated implications of functional job literacy research for instruction. The needs of non-English speakers, ie. ESL-literacy in the workplace, were the focus of projects sponsored by the Experiment in International Living ("Shifting Gears 2. Hands-on Activities for Learning Workplace Skills and English as a Second Language," 1984), and the Centre for Applied Linguistics ("From the Classroom to the Workplace: Teaching ESL to Adults," 1983). Special occupational literacy strategies for learning disabled adults were outlined by Seitz and Scheerer (1983) and by Davis and Woodruff (1985). Some projects have been commissioned to develop literacy programs for specific corporations (Pagurek & Fitzgerald, 1984), while others investigate literacy programs offered in-house by business and industry (Baar-Kessler, 1984; Kirsch & Guthrie, 1982, 1983; Mark, 1984). Other studies are directed at specific types of occupational literacy, such as graphical

literacy (Sofo, 1985), technical literacy (Conklin & Reder, 1985; Northwest Regional Educational Lab, 1984), and computer literacy (Goodard, 1983; Hill, 1985; Hunter & Aiken, 1984). Most of these studies are available from ERIC and can provide the specifics needed for specialized programs. Basically this means that ABE instructors and curriculum developers need not begin by conducting their own intense research, especially when each student may present a different occupational goal.

Workplace Literacy and ABE

Why is it a good idea to incorporate instruction in employment-related reading into ABE programs? Theory in the field of adult education suggests that adult students desire and benefit most from tasks that have immediate application and personal relevance. Employment is a vital interest of very many ABE students. The use of occupational reading materials is therefore highly motivating to many students. There is an additional aspect of social responsibility that enters as well; ABE programs must help adult students to become actively involved in the life and work of their communities. It would be highly irresponsible to ignore employment-related literacy.

The incorporation of workplace literacy skills into ABE curriculum seems both desirable and possible. As with all adult education endeavors, instruction in work-related reading and writing should be relevant to the individual in terms of need and timing, ie. what the student needs when it is needed for success in employment. It is therefore impossible to totally generalize workplace literacy instruction. The specific types of materials, the levels of difficulty and the necessary strategies vary according to the job and must be determined either through accessing research findings or

intensive investigation on the part of instructors.

Although workplace literacy instruction must be tailored to individuals or to occupational groupings, there are some generalizations that research substantiates. Rush (1985) recommends that instructors prepare ABE students for success in work roles by:

- developing reading lessons around specific work topics and with real work materials;
- teaching the meaning and recognition of essential work-related vocabulary;
- stressing instruction in reading graphic information;
- emphasizing the application of reading-to-do skills by involving such tasks as following directions;
- teaching reading-to-learn skills to students going on to occupational training programs;
- allowing for the repetitive nature of reading on the job; and
- encouraging the use of alternate sources of information as an aide to comprehension.

In summation, it is imperative that the situation which has lead to the crisis in adult and occupational illiteracy not be duplicated in ABE programs. Curriculum developers can look to research for knowledge of the competencies required in specific job and training settings. Instructors can focus on the use of the principles of adult learning and content area reading. Adults can be better prepared for literacy in the workplace.

REFERENCES

Abram, M. J. Readability: Its use in adult education. Lifelong Learning, 4 (1981), pp. 8-9, 30-31.

Adams Report. Education and Working Canadians. Ottawa, ON: Commission of Inquiry on Educational Leave and Productivity, 1979.

Auten, A. The Challenge: Job Literacy in the 1980's. Journal of Reading, 23, 8 (1980), pp. 750-753.

Baar-Kessler, M. An Analysis of the Concept of "Literacy" and Investigation of the Fortune 500 Companies in Literacy Training. M.Ed. Thesis, Rutger's University, 1984.

Basic Skills in the Workforce. The Contrasting Perceptions of Business, Labor and Public Education. New York, NY: Centre for Public Resources, 1982.

Bricknell, H. M. National Perspectives on Career Education. In Nielsen & Hjelm (Eds.), Reading and Career Education. Newark, DE: International Reading Association, 1975.

Business Council for Effective Literacy. Newsletter, 1, 8 (1986), pp. 3.

Caylor, J. S., Sticht, T. G., Fox, L. C., & Ford, J. P. Methodologies for Determining Reading Requirements of Military Occupational Specialties. Alexandria, VA: Human Resources Research Organization, 1973.

Chang, Kathryn L. Reading Demands of the Plumbing Trade. Unpublished master's thesis, University of Calgary, Calgary, AB, 1983.

Cheek, M. C., & Cheek, E. H. Tips for administrators on content area reading. NASSP Bulletin, (1981, April), pp. 81-85.

Conklin, N. F. & Reder, S. Changing Channels: A Guide to Functional Literacy for the Automated Workplace. Portland, OR: Northwest Regional Educational Lab, 1985.

Copperman, P. The Literacy Hoax: The Decline of Reading, Writing & Learning in the Public Schools and What We Can Do About It. New York, NY: Morrow, 1978.

Curran, T. E. Readability Research in the Navy. In Sticht & Zapf (Eds.), Reading and Readability Research in the Armed Services. Alexandria, VA: Human Resources Research Organization, 1976.

Davis, B. & Woodruff, N. Trade Related Reading Packets for Disabled Readers. Sewell, NJ: Gloucester County Vocational-Technical School, 1985.

Dawkins, J. Syntax and readability. Newark, DE: International Reading Association, 1975.

Diehl, W. A. Functional Literacy as a Variable Construct: An Examination of Attitudes, Behaviors and Strategies Related to Occupational Literacy. Unpublished doctoral dissertation, Bloomington, IN, 1980.

Diehl, W. A. & Mikulecky, L. The Nature of Reading at Work. Journal of Reading, 24, 3 (1980), pp. 221-227.

Dienstfrey, H. & Kingston, R. Priorities for the Nation's Schools. Dayton, OH: Domestic Policy Association, 1983.

Duke, C., & Powers, A. Reading in the content area. Clearing House, 47 (1973), pp. 221-226.

Farning, M. & Boyce, E. Developing and Verifying a List of Competencies for the Communication Skills Area in Vocational/Technical Post-Secondary Education. Wisconsin Rapids, WI: Mid-State Vocational, and Adult Education District, 1976.

Fisher, D. L. Functional Literacy and the School. Washington, DC: National Institute of Education, 1978.

Gadway, C. & Wilson, H. A. Functional Literacy: Basic Reading Performance. Denver, CO: National Assessment of Educational Progress, 1975.

Gibson, W. D. Relationship between difficulty levels of assigned English texts and the reading ability of community college students. Dissertation Abstracts International, 31 (1971).

Goodman, K. Behind the eye: What happens in reading. Reading-Process and Programs. Urbana, IL: National Council of Teachers of English, 1970.

Guthrie, J. et al. Relationships among Competencies and Practices of Reading. Newark, DE: International Reading Association, 1984.

Harrison, C. Readability in the classroom. Cambridge, MA: Cambridge University Press, 1980.

Hawes, G. et al. Careers Today. New York, NY: Taplinger Publishing Co., 1977.

Hawkins, J. A., Jr. How should reading and study skills test scores correlate? Journal of Reading, 20 (1977), pp. 570-572.

Heinemann, S. T. Can Job-Related Performance Tasks be Used to Diagnose Secretaries Reading and Writing Skills? Journal of Reading, 23, 3 (1979), pp. 239-243.

Herber, H. L. Teaching reading in the content areas. New York: Prentice-Hall, 1978.

High Schools and the Changing Workplace. The Employers' View. Report of the Panel on Secondary School Education for the Changing Workplace. Washington, DC: Institute of Medicine, 1984.

Hill, K. H. J. Adult Computer Literacy. Paper submitted to an Advanced Seminar in Adult and Continuing Education, Kansas, 1985.

Horne, G. P. Functional Job Literacy: Implications for Instruction. Wellesley, MA: The Commonwealth Center for High Technology/Education, 1979.

Howell, J. D. An Indentification of the Competence in English Needed by Vocational Students in the Community Colleges and Technical Institutes in North Carolina. Unpublished doctoral dissertation, North Carolina State University at Raleigh, 1976.

Hunt T. & Lindley, C. T. Documentation of Selection and Promotion Test Questions: Are Your Records Sagging? Public Personnel Management, October - November 1977, pp. 415-421.

Hunter, B. & Aiken, R. Computer Literacy in Vocational Education: Perspectives and Directions. Knoxville, TN: Tennessee University, 1984.

Hunter, C. & Harman, D. Adult Illiteracy in the United States. New York, NY: McGraw-Hill, 1979.

Hymowitz, L. Employers Take Over Where School Failed to Teach Basics. Wall Street Journal, 1981, January 22, pp. 1.

Irwin, J. W., & Davis, C.A. Assessing readability: The checklist approach. Journal of Reading, 24 (1980) pp. 124-130.

Jacob, E. & Crandall, J. Job-Related Literacy: A Look at Current and Needed Research. Bloomington, IN: Center for Applied Linguistics, 1979.

Kirsch, I. & Guthrie, J. T. The Concept and Measurement of Functional Literacy. (1977-1978) In Karnes, Ginn and Maddox (Eds.), Issues and Trends in ABE. Jackson, MS: University of Mississippi Press, 1980.

Kirsch, I. & Guthrie, J. Prose Comprehension and Text Search as a Function of Reading Volume. Newark, DE: International Reading Association, 1982.

Kirsch, I. & Guthrie, J. Case Studies of Reading in a High Technology Corporation. Newark, DE: International Reading Association, 1982.

Kirsch, I. & Guthrie, J. Reading Practices of Adults in One High Technology Company. Newark, DE: International Reading Association, 1983.

Kozol, J. Prisoners of Silence. New York, NY: Continuum Publishing Co., 1980.

Lee, H. D. Dealing with reading in industrial arts. Journal of Reading, 24 (1981), pp. 663-668.

Levin, B. J. Reading Requirements for Satisfactory Careers. In Nielsen & Hjelm (Eds.), Reading and Career Education. Newark, DE: International Reading Association, 1975.

Louis, Harris & Associates. Survival Literacy: Conducted for the National Reading Council. New York, NY: Louis, Harris & Associates, 1970.

Mark, J. L. Private Sector Providers of Basic Skills Training in the Workplace. Washington, DC: American Association for Adult and Continuing Education, 1984.

Mikulecky, L. School Training and Job Literacy Demands. The Vocational Guidance Quarterly, December 1981, pp. 174-180.

Mikulecky, L. Job Literacy: The Relationship Between School Preparation and Workplace Actuality. Reading Research Quarterly, 17 (1982), pp. 400-419.

Mikulecky, L. Preparing Students for Workplace Literacy Demands. Journal of Reading, 282, 3 (1984), pp. 253-257.

Mikulecky, L. Literacy Task Analysis: Defining and Measuring Occupational Literacy Demands. Paper presented at the National Adult Educational Research Association, Chicago, 1985.

Mikulecky, L. & Diehl, W. Literacy Requirements in Business and Industry. Paper commissioned for the National Institute of Education. Bloomington, IN: Reading Research Center, 1979.

Miller, G. A. (Ed.) Linguistic Communication: Perspectives for Research. Report of the study group on Linguistic Communication on the National Institute of Education, Newark, DE: International Reading Association, 1973.

Mockovak, W. P. Literacy Skills and Requirements in Air Force Career Ladders. Final Report. Lowry AFB, CO: Air Force Human Resources Lab, 1974.

Moe, A. J., Rush, R. T. & Storlie, R. L. The Literacy Requirements of a Licensed Practical Nurse on the Job and in a Vocational Training Program. West Lafayette, IN: Department of Education, Purdue University, 1979.

Murphy, R. T. Adult Functional Reading. Study; Project 1: Targeted Research and Development Reading Program Objectives Subparts 1, 2 and 3. Princeton, NJ: Educational Testing Service, 1975.

Niebuhr, H. L. Perspective on Literacy: Society's Stake in the Literate Population. In Functional Literacy and the Workplace. Washington, DC: American Council of Life Insurance, 1983.

Noe, K. S. Technical Reading Technique: A Briefcase Reading Strategy. Journal of Reading, 27, 3 (1983), pp. 234-237.

Olson, D. R. Review of Toward a Literate Society. Proceedings of the National Academy of Education. 2 (1975), pp. 108-178.

Pagurek, J. & Fitzgerald, B. English in the Workplace: McDonald's Executive English. In Carleton Papers in Applied Language Studies. Ottawa, ON: Carlton University, 1984.

Pearson, P. D., & Johnson, D. D. Teaching Reading Comprehension. New York: Holt, Rinehart & Winston, 1978.

Ross, N. An Analysis of the Nature and Difficulty of Reading Tasks Associated With Beginning Office Workers Jobs in the Columbus, Ohio Metropolitan Area. Paper presented at the Annual Meeting of the American Educational Research Association, Boston, MA, April 1980.

Rush, R. T. Job Skills: Basic Literacy and Related Competencies. Adult Literacy and Basic Education, 1, 9 (1985), pp. 35-44.

Schulteis, R. A., & Napoli, K. Strategies for helping poor readers in business subjects. Business Education Forum, 30 (1975), pp. 5-11.

Seitz, S. & Scheerer, J. Learning Disabilities: Introduction and Strategies for College Teaching. Massachusetts: 1983.

Sharon, A. What Do Adults Read? Reading Research Quarterly, 9 (1973), pp. 148-169.

Smith, A. D. Reading Skills - What Reading Skills? In Merritt, J. E. (Eds.), New Horizons in Reading. Newark, DE: International Reading Association, 1976.

Sofo, F. A Different Approach to Literacy: Graphics. Australian Journal of Adult Education, 25, 20 (1985), pp. 27-34.

Spicer, C. The Identification of Communication Competencies Required by Future Businesspersons: An Application of the Delphi Method. Paper presented at the International Communication Association annual meeting, Chicago, April, 1975.

Stansell, J. C., & DeFord, D. E. When is a reading problem not a reading problem? Journal of Reading, 25 (1981), pp. 14-20.

Sticht, T. G. (Ed.) Reading for Working: A Functional Literacy Anthology. Alexandria, VA: Human Resources Research Organization, 1975.

Sticht, T. G. Literacy and Vocational Competence. Occasional Paper No. 39, Columbus, OH: The National Center for Research in Vocational Education, April 1978.

Sticht, T. G., Caylor, J. C., Kern, R. & Fox, L. Project REALISTIC. Determination of Adult Functional Literacy Skills Levels. Reading Research Quarterly, 7 (1972), pp. 424-465.

Sticht, T. G. & Mikulecky, L. Job-Related Basic Skills: Cases and Conclusions. Columbus, OH: ERIC Clearinghouse on Adult Career, and Vocational Education, 1984.

Technological Literacy Skills Everybody Should Learn. Ideas for Action in Education and Work. Poretland, OR: Northwest Regional Educational Lab, 1984.

Thomas, A. M. Adult Basic Education and Literacy Activities in Canada 1975-76. Toronto, ON: World Literacy of Canada, 1976.

Thornton, L. J. Relationship of Carpentry Material Installation Instructions and Carpentry Textbooks to Reading Ability of High School Carpentry Textbooks to Reading Ability of High School Carpentry Students. Unpublished masters thesis, Suny College of Technology, Utica, NY, 1977.

Thornton, L. J. Reading Sensitivity in Post-Secondary Occupational Education. Lifelong Learning: The Adult Years, 3, 4 (1979), pp. 12-15, 19.

Thornton, L. J. Review and Synthesis of Reading in Post-Secondary Occupational Education. Pennsylvania State University, April 1980.

Vacca, R. T. Content Area Reading. Boston: Little, Brown and Co., 1981.